Landsat 7 Flight Operations Status (Spacecraft and MOC)

U.S. Department of the Interior
U.S. Geological Survey

Landsat 7
Spacecraft and Ops Events

- 10/11/00 (Day 285) Delta-Inclination maneuver successfully completed, start time 13:52:40Z, duration 1172.3 seconds.

- 11/17/00 - 11/18/00 (Days 322, 323) Spacecraft passed through the Leonid storm without incident.

- 11/20/00 (Day 325) - “Lights Out” operations began.

- 12/25/00 (Day 360) - Spacecraft passed through the Moon’s shadow on two back-to-back orbits. Overall power balance and configuration was normal at the end of each orbit.

- 12/27/00 (Day 362) RTCS table in Flight Software was updated with new “end-o-year” RTCS values in preparation for 01/01/01.

- 12/31/00 (Day 366) - End of year operations completed successfully on SCP1.

- 01/10/01 (Day 10) End of year operations completed successfully on SCP2.

Landsat 7
Spacecraft and Ops Events (cont.)

02/09/01 (Day 040) - Added coordinates in FSW on both SCPs for DSN testing (Canberra).

02/11/01 (Day 042) to 02/13/01 - SSR PWA #12 anomaly and recovery . See anomaly section for details.

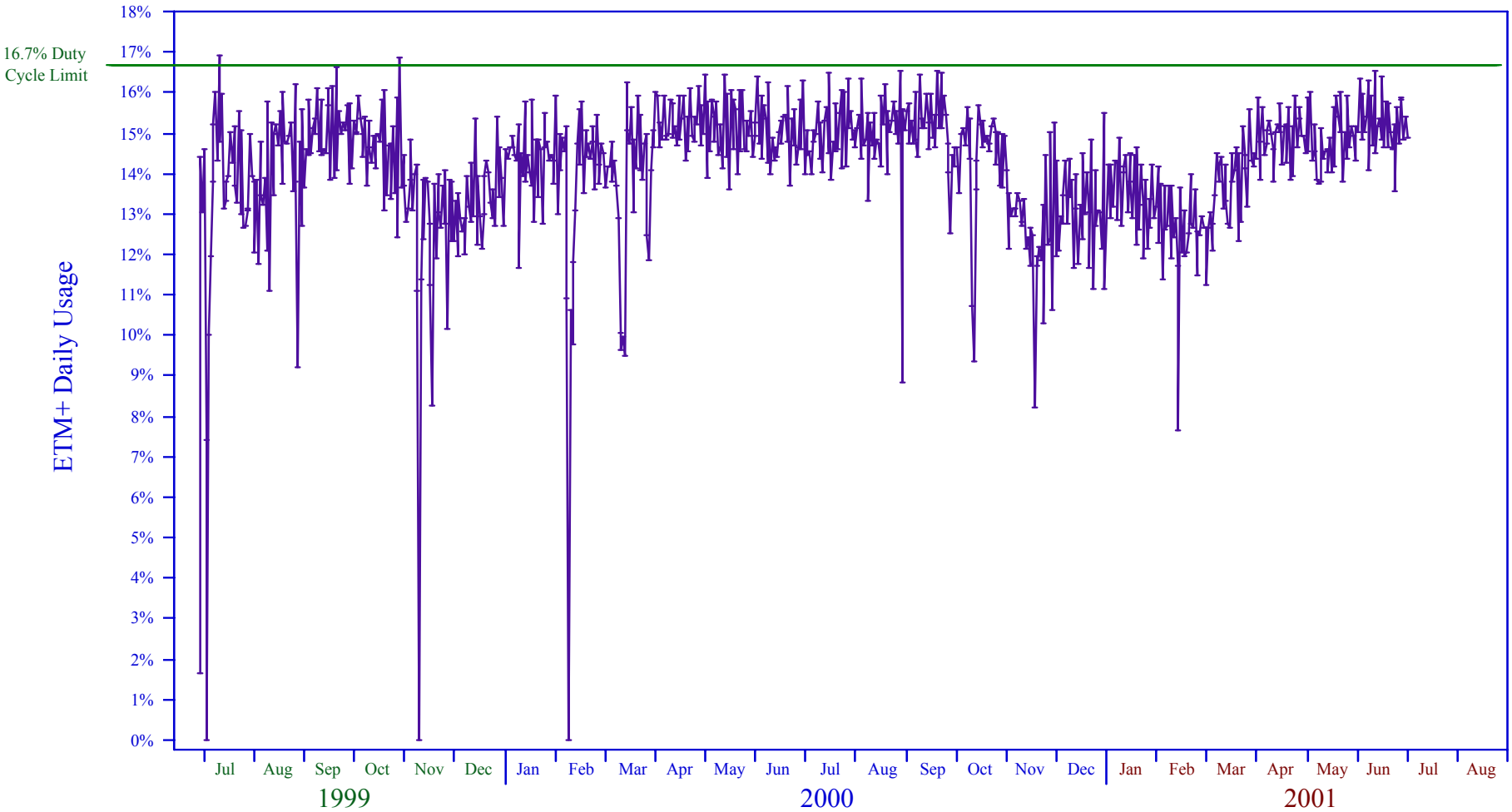
03/05/01 (Day 064) - CIU Buffer Busy" anomaly - no interruption to operations. See anomaly section for details.

04/10/01 (Day 100) - Changed the gyro channel used for Roll information in Backup ACS modes (GCYAW) from Xa to Xb.

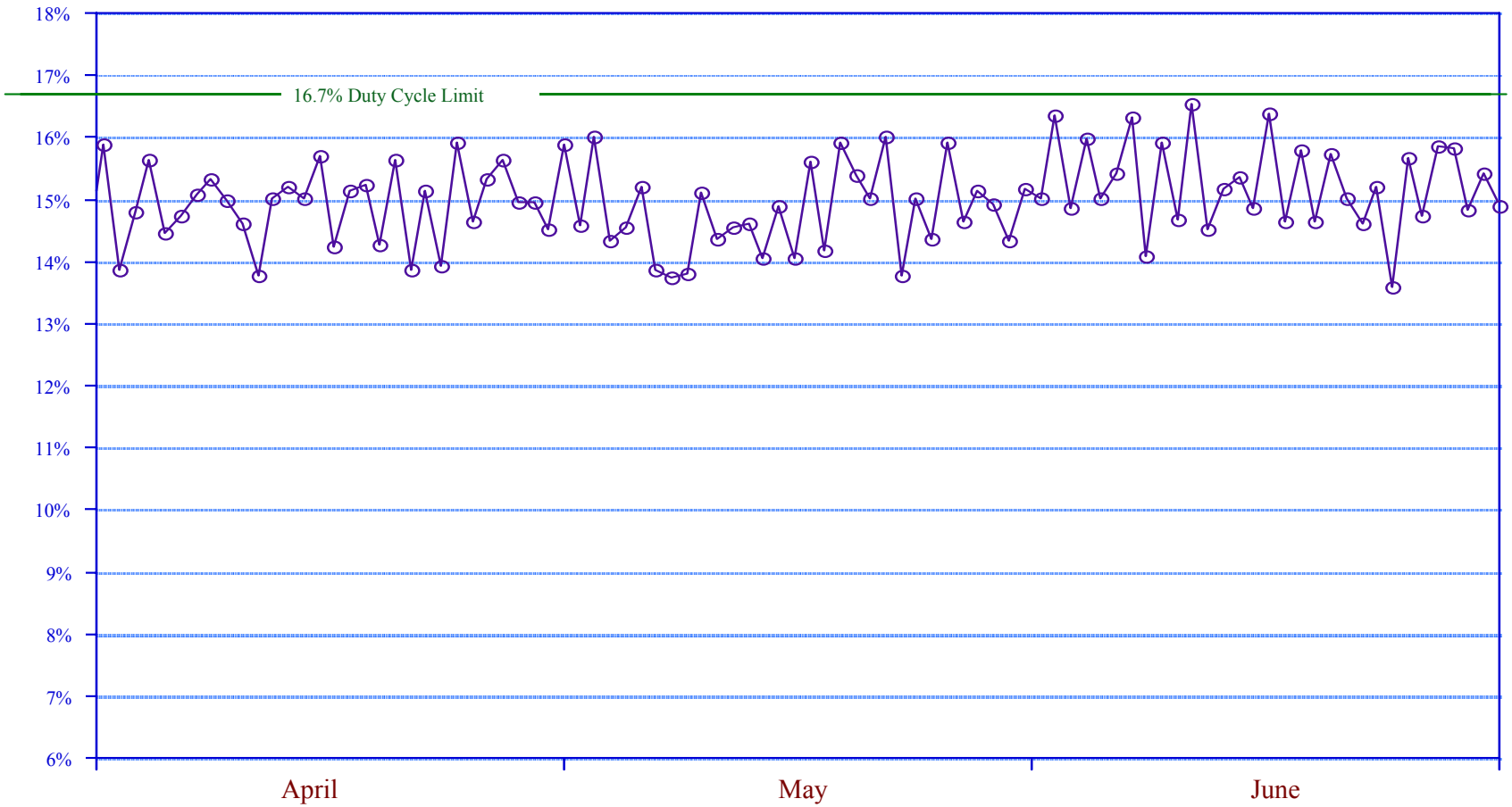
04/11/01 (Day 101) - Uplinked a patch to SSR RAM that will allow blocks to be "renamed" into areas that contain blocks that already "exist".

05/11/01 (Day 131) - Added coordinates in FSW on both SCPs for Matera, Italy

ETM+ Utilization : Lifetime Trend



ETM+ Utilization:April-June 2001



Landsat 7 Spacecraft Current Status

- Spacecraft Hardware and Software remains in the same configuration found at the end of the on-orbit checkout period except for the following:
  - Downlink site additions
  - RTCS updates
  - Time/year parameters
  - ESA Sun interference report timing
  - PRADS reset limit for unidentified stars
  - Celestial Star Sensor (CSA) alignment matrix
  - Maneuver abort limit due to attitude errors
  - SSR PWA #23 and #12 not in use
  - Gyro channel used for Roll data/control when in Backup modes switched from Xa to Xb
  - SSR RAM patches for hk dumps, TDF-SSR anomaly, and SSR-Rename anomaly

- Spacecraft orbit continues to meet specifications. To date, 45 orbit raising burns and 2 inclination raising burns have been completed.

- **Spacecraft performance and operation is nominal**. Mission objectives are being met and there are no indications of this changing in the near-term.

Landsat 7 Spacecraft Anomalies

02/11/01 (Day 042) - SSR PWA #12 shutdown without being commanded.

- -"Loss of modulation" reported by LGS operator. Investigation showed a failure of SSR PWA #12.
- 02/12/01 (Day 043) - Switched to "Realtime imaging" only.
- 02/13/01 (Day 044) - SSR PWA #12 removed from service. Normal operations resumed.

03/05/01 (Day 064) - CIU Buffer Busy.

- During loading of the daily stored command load, FSW calculated a different checksum for the load than the scheduling system. In addition, the "CIU Buffer Busy" condition was indicated by the spacecraft.
- Load was rebuilt (although original load was valid) and uplinked at next contact without incident. No interruption to operations.
- Investigation (including a dump of FSW before any more loads were uplinked) revealed that an extra 16 bits had been "inserted" into the command stream at the CIU/SCP interface. The CIU declared itself "busy" during a word transfer, and the SCP/FSW seemingly "double read" the previous word.
- Currently, no root cause can be found. Active investigation closed.

Landsat 7
On-Going Investigations/Efforts

The Flight Ops Team is working on several ongoing investigations/efforts...

SSR -

-Implementation of the second patch is complete. Operational testing is ongoing. Preliminary results are good.

-Generation of SSR PWA board activation procedures is underway.

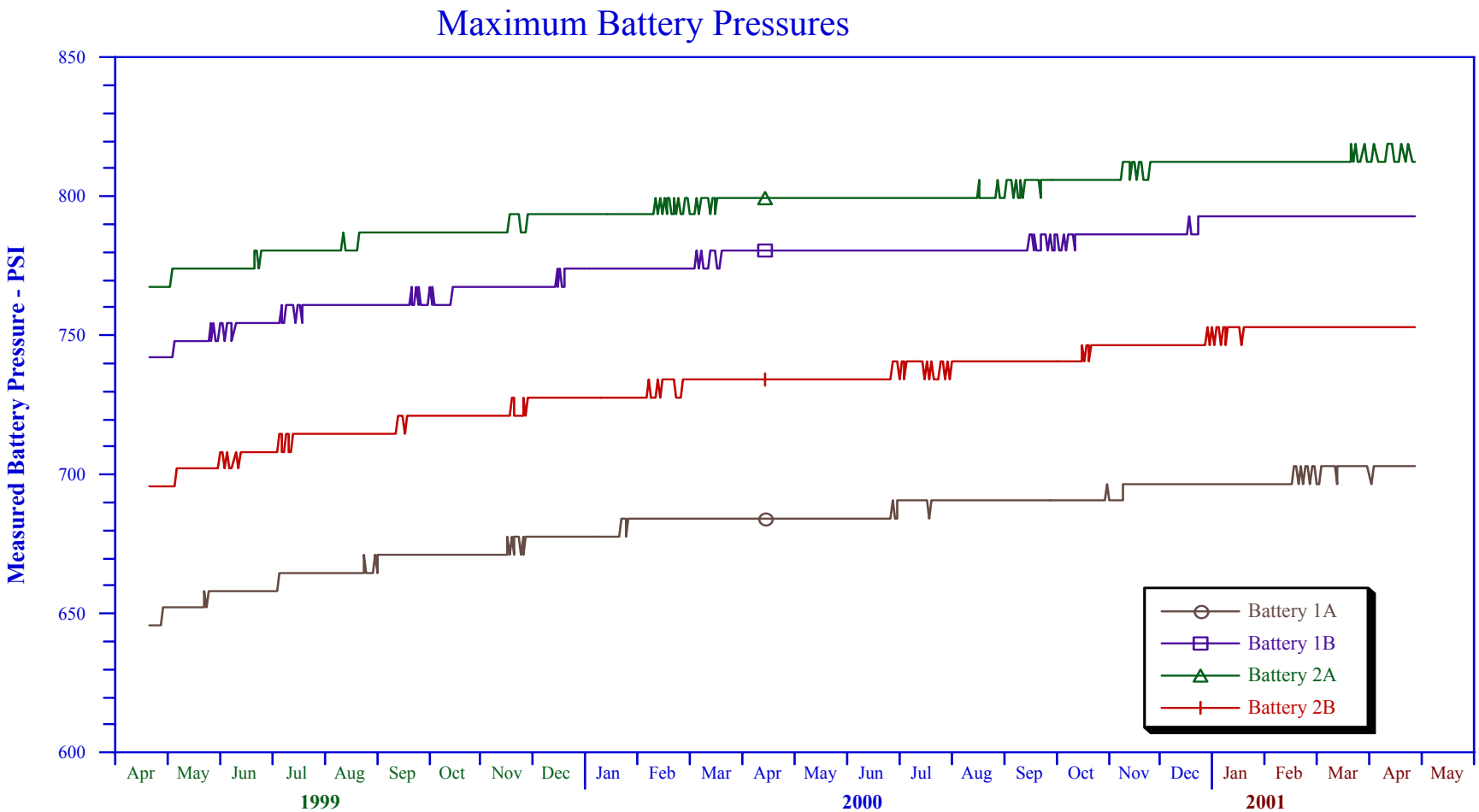
Battery Pressure - Procedures for possible use in lowering pressure (in an anomaly situation) are being generated. (see plot)

ETM+ Turn Around Time (TAT) - No change from last month. (see plot)

ETM+ duty cycle - Possible changes to LTAP may affect ETM+ use.

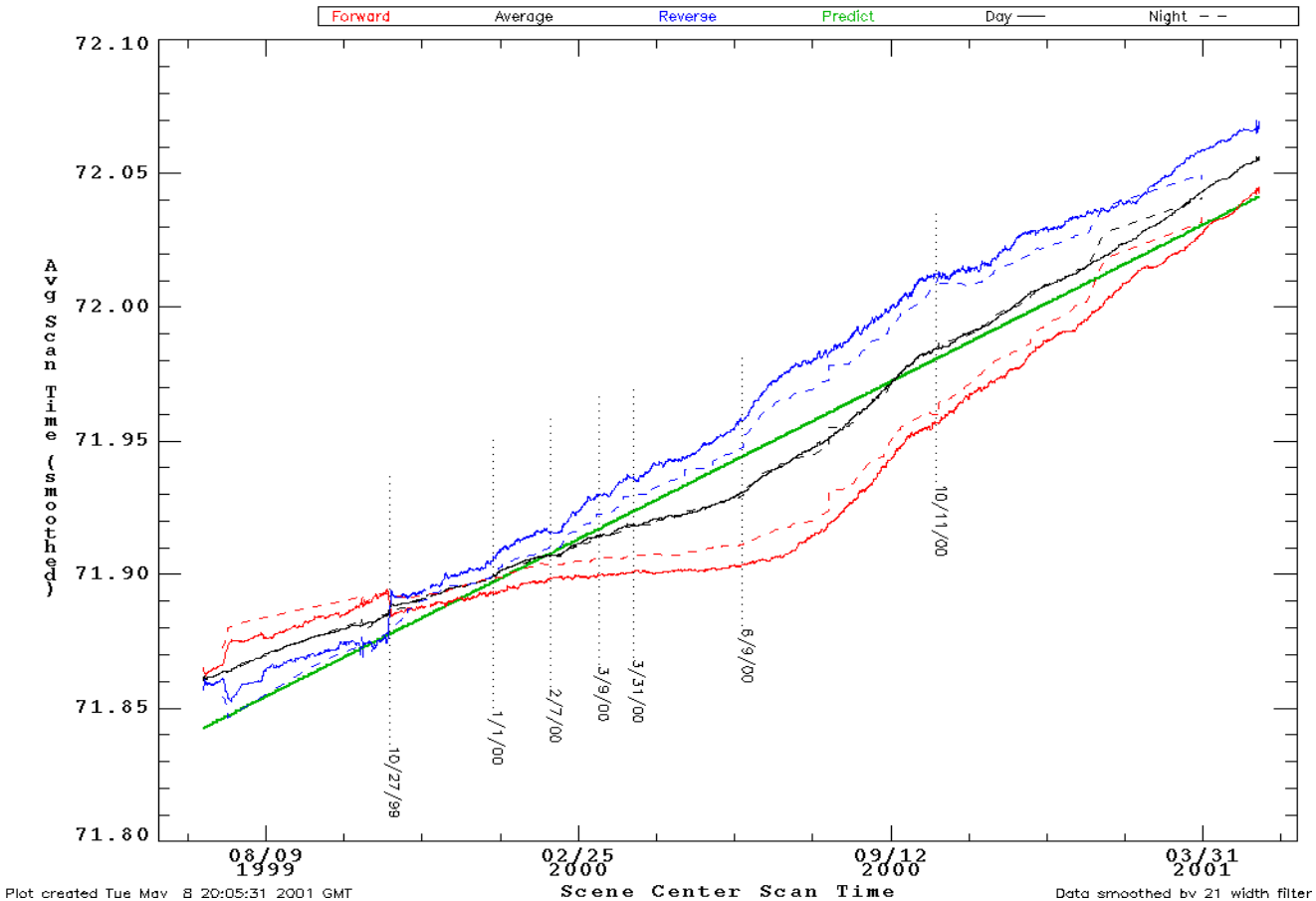
Investigation into gyro bias changes for Gyro #2 continues. Other users of this IMU package have been consulted. MGS and NOAA-15 reports being reviewed. Bias seems to be settling. (See plots)

Landsat 7
On-Going Investigations/Efforts



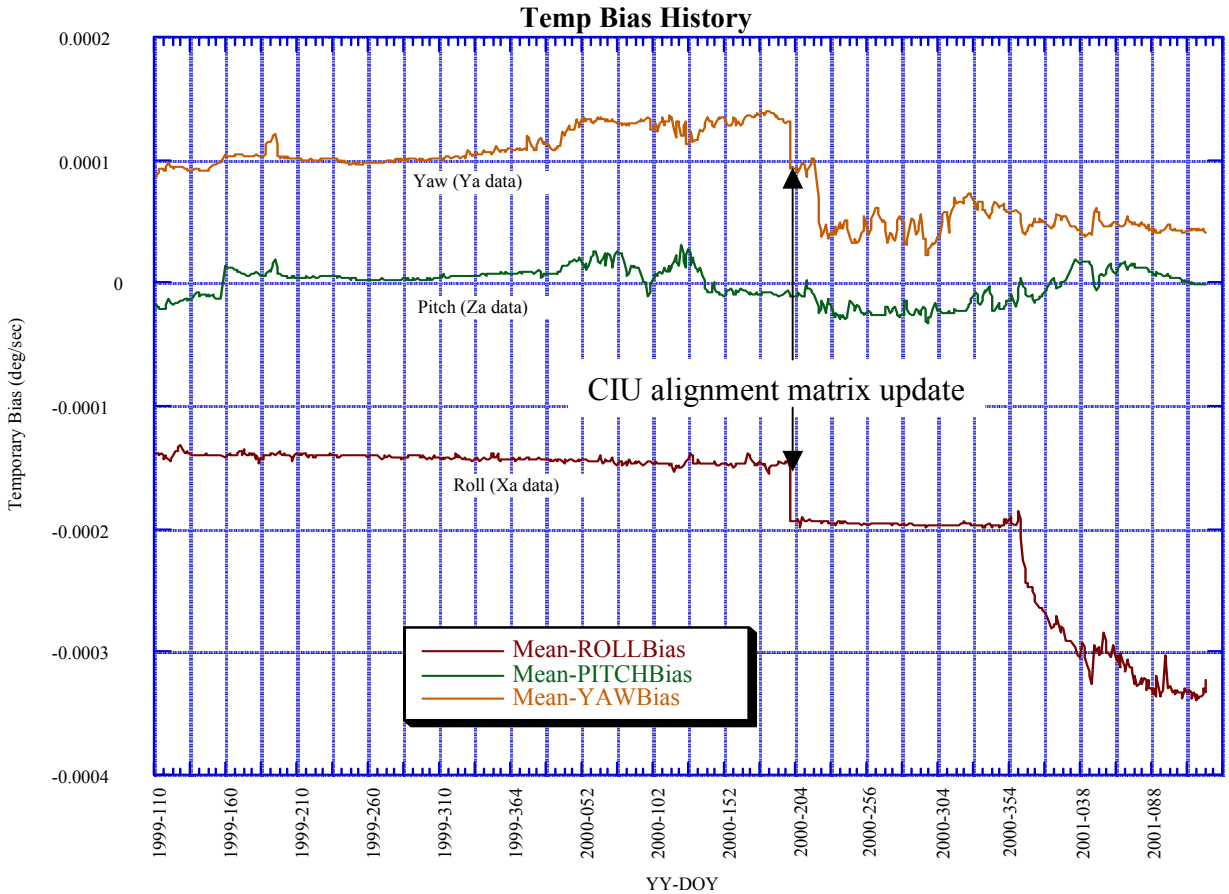
Landsat 7
On-Going Investigations/Efforts

ETM+ Scan Time (from IAS web site)



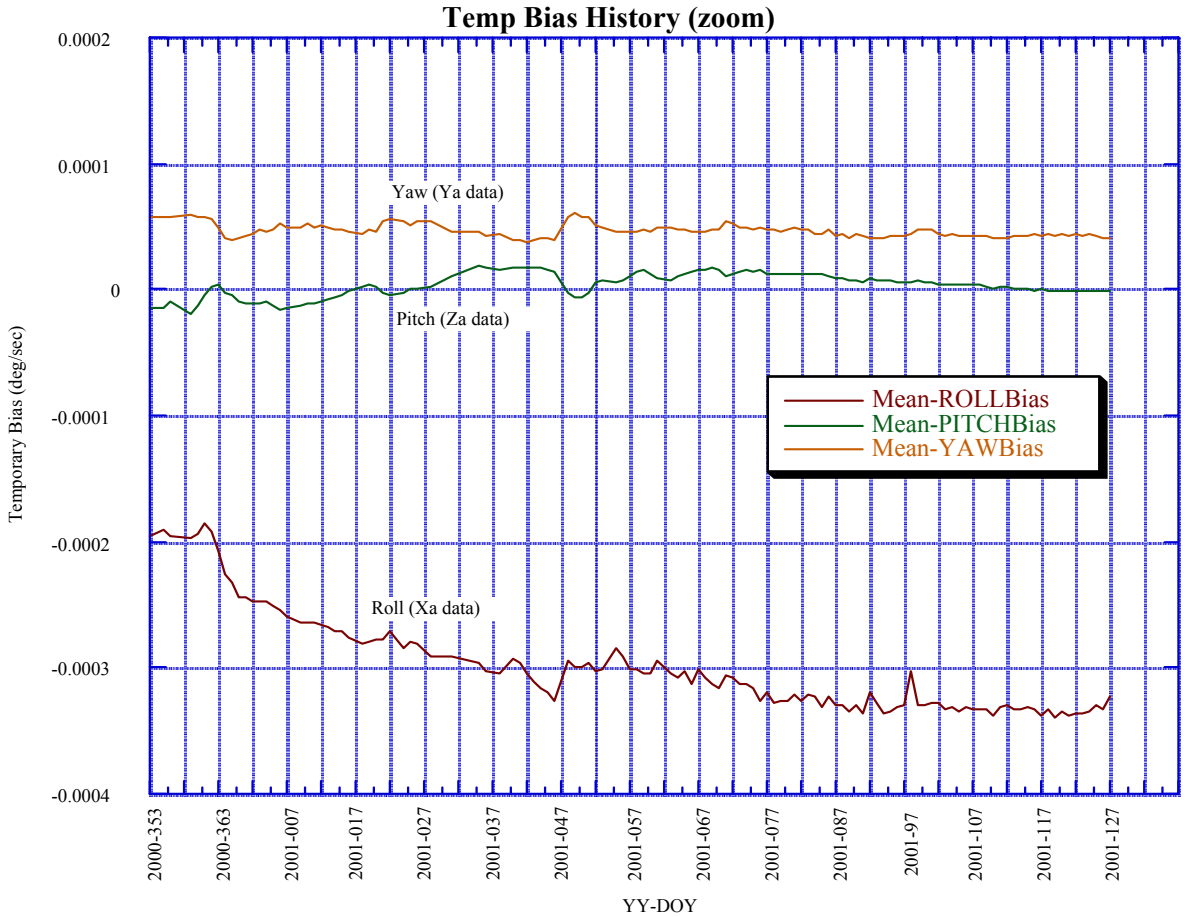
Landsat 7
On-Going Investigations/Efforts

Gyro Bias (for the three operational channels)

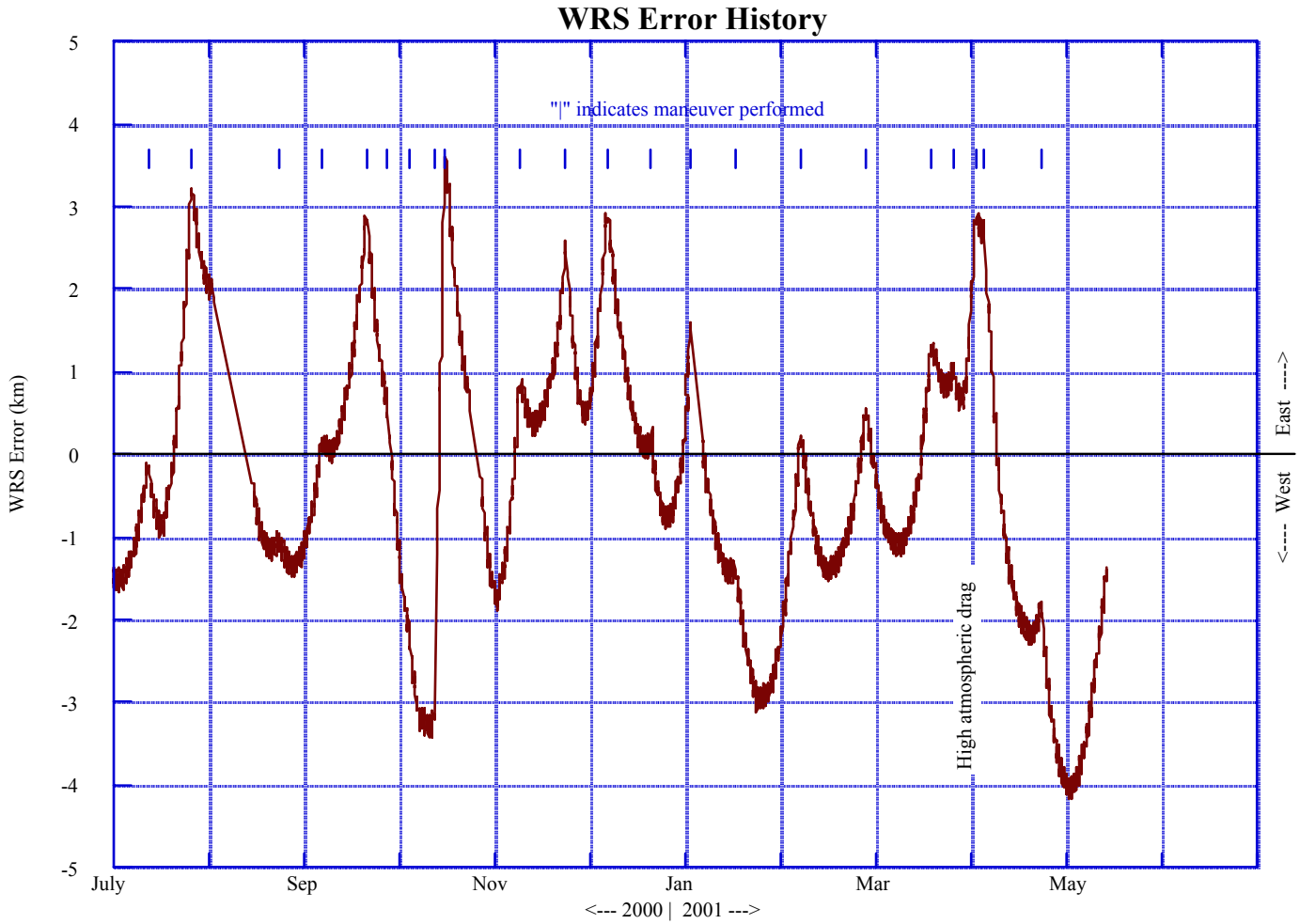


Landsat 7
On-Going Investigations/Efforts

Gyro Bias (for the three operational channels)



Landsat 7
Orbit and Expendables



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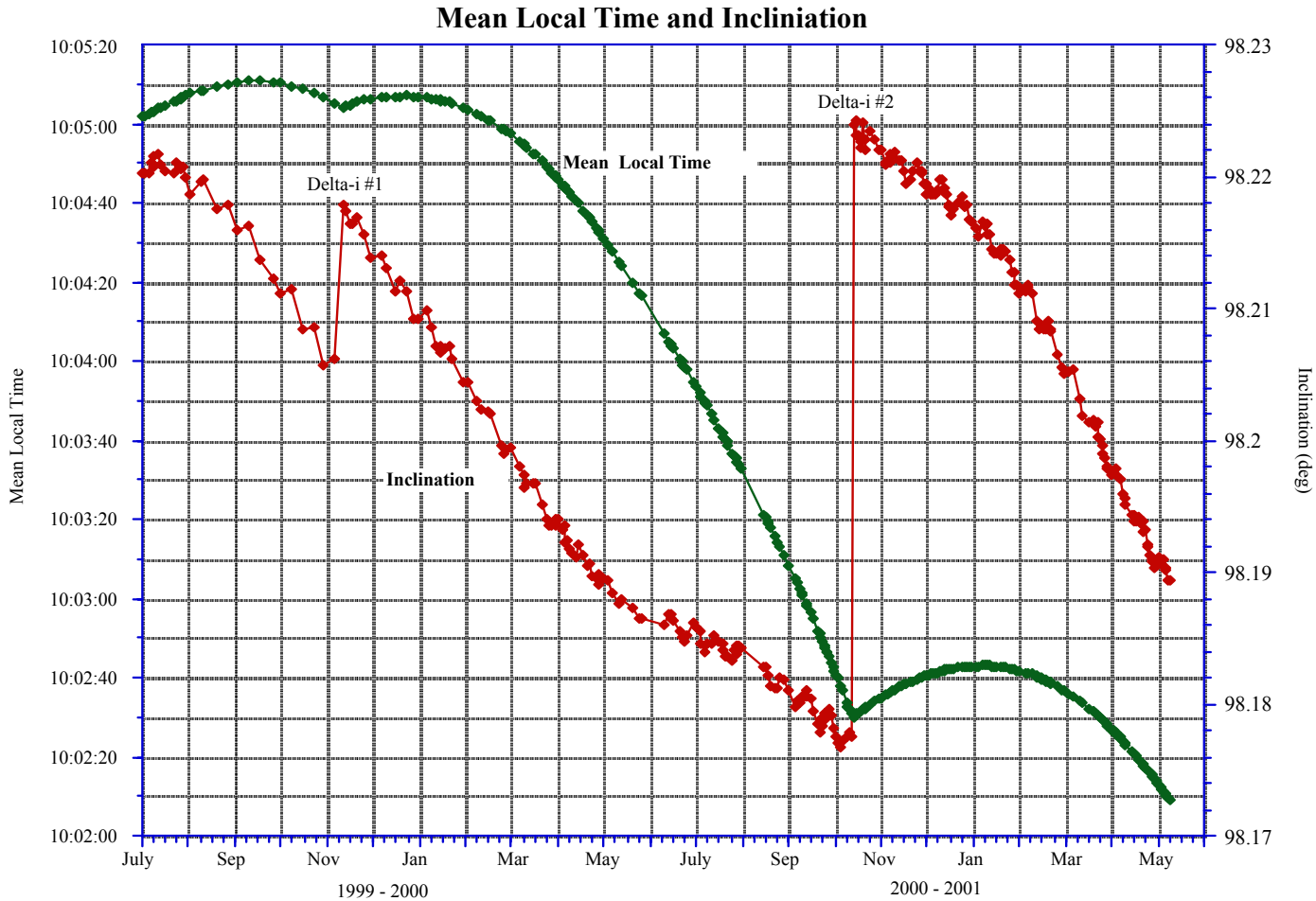
Orbit and Expendables



MOC Status

MOC Status

- Current MOC Status…
  - MOC hardware and software are **Green** and able to support operations.

- Landsat 7 On-Orbit Flight Automation (LOOFA) Status (June)

107 automated passes scheduled during June 2001.

105 automated passes successfully completed.

2 automated passes not completed due to command problems at sites.

Selected System pages :

Most “pages” were generated in response to line outages between the MOC and ground site, and PTP or other connections problems at the sites.

Upcoming Activities (next 3 months)

- S/C
  - Begin planning for Delta-i #3
  - Dust off Leonid plan
- MOC
  - IPM web tool integration on IGS NT Server and interface to the MOC scheduling system
  - Version Manager (VM) testing